

## Gearing and Negative Gearing

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### Introduction

The purpose of this paper is to clarify some aspects of geared investments which are investments partially financed from a loan. Gearing is a standard tool of investment and although it is usually applied to property or share portfolios, the approach can be applied to any asset. Some investors are resistant to it because they think it is risky, but the same people have often made large leveraged investments in the family home.

The second section of the paper outlines the basics of gearing and the factors that affect the return earned on a leveraged asset holding.

The third section demonstrates that a share portfolio can contain "hidden leverage".

The fourth section looks at margin loans.

The fifth section considers instruments which provide leverage without requiring an explicit loan. They are particularly useful for superannuation funds which are not permitted to borrow.

### Gearing and Negative Gearing

A geared investment is one in which funds are borrowed to buy an asset. The value of the asset can then be divided:

$$\text{Market Value of Asset} = \text{Loan} + \text{Equity}$$

The Loan to Valuation Ratio (LVR) is equal to:

$$\text{LVR} = \frac{\text{Loan}}{\text{Market Value of the Asset}}$$

As the market value of the asset increases, the equity of the investor also increases and the LVR ratio falls. The investor can maintain a constant LVR by increasing the size of the loan when the market value of the asset increases.

The interest cost of the loan can be written off against income generated by the asset (such as dividends or rent) for taxation purposes. Negative gearing occurs when the interest cost exceeds the cash flow produced by the asset. In that case, the excess can be written off against other income so long as the ATO is satisfied that the asset is a productive one capable of producing income in the future. Investment property, shares and units in managed funds certainly satisfy this condition. This situation is advantageous when the asset concerned generates significant capital gains because capital gains are taxed only on realisation and they can be deferred until the taxpayer is subject to a lower tax rate, and only 50% of realised capital

gains are included in taxable income for an individual.

The attraction of gearing is that it magnifies any gains made on an investment. To illustrate this effect, assume that we buy an asset for \$300,000, but fund \$200,000 of the purchase from a loan. Assume that the borrowing rate is 10% p.a. so that the interest cost is \$20,000. The value of the asset increases by 20%, i.e. \$60,000. The net profit is \$40,000 which represents a return of 40% on the original investment. Without gearing, we would have made only the base 20%. In this simple example, the break-even appreciation in the price of the asset is 6.67%.

Assume now that the investor is subject to a 50% marginal tax rate and has other income from which the interest cost can be deducted. The after-tax interest cost is then \$10,000 and a 20% appreciation gives a return of 50%. Note that this analysis makes no allowance for the capital gains tax that will eventually be payable on the appreciation. The break-even rate of appreciation is 3.33%.

However, leverage is a two-edged sword. It also magnifies losses. Assume that, in our simple example, the value of the asset falls by 10%. The loss for the year (including interest cost) is \$50,000; that is, a loss of 50% on the original investment.

Many aspects of gearing can be elucidated in terms of the following expression which explains the return (R) on a leveraged investment in an asset. It is assumed that the only returns on the asset are unrealized (and, therefore, untaxed) capital gains and that interest costs are fully tax deductible at a rate t.

$$R = \frac{1}{1-w} r_A - \frac{w}{1-w} (1-t)r_L$$

where  $r_A$  = return on the asset

$r_L$  = borrowing rate

w = ratio of the loan to the value of the asset

t = investor's tax rate

For example, assume that  $w = 1/2$ . This is, for example, the case with instalment warrants.

Then

$$R = 2r_A - r_L(1-t)$$

For example, if  $r_A = 12\%$  (which is close to the long-run return on shares or property),  $r_L = 8\%$  and  $t = 1/2$ , the return is

$$R = 24\% - 1/2 \cdot 8\% = 20\%$$

If  $w = \frac{3}{4}$  (a higher leverage)

$$R = 4r_A - 3r_L(1 - t)$$

For the figures used in the previous example

$$R = 48\% - 3.8.5\% = 36\%$$

The formula for a leveraged asset investment has a number of implications. The formula can be rewritten.

$$R - r = \frac{w}{1 - w} r_A - \frac{w}{1 - w} r_L(1 - t) = \frac{w}{1 - w} [r_A - (1 - t) r_L]$$

The figure is negative (i.e. the investment is a loss) if  $r_L(1 - t) > r_A$ . That is, gearing is useful only if the return on the asset exceeds the after-tax cost of borrowing. This is more likely the higher the relevant tax rate. Therefore, gearing is more attractive for an individual on the highest marginal tax rate than for, say, a superannuation fund.

It is also clear that the loss is greater the higher the leverage ( $w$ ). This indicates that highly geared positions are very risky in that they generate larger losses and gains.

The break-even rate of capital gains on the asset is lower:

- the higher the gearing (the greater the proportion of debt);
- the higher the income (cash flow) generated by the asset;
- the lower the interest rate paid on the debt;
- the higher the marginal tax rate paid by the investor. Therefore, it is advantageous to take the loan in the name of the taxpayer in the family who is in the highest tax bracket; and
- the lower the capital gains tax rate.

The effective rate of capital gains tax falls as the gearing structure is maintained for a longer period of time. Also, the variability of the capital gains/losses on an asset falls as the time over which the return is calculated increases. Therefore, the time horizon of the investment is an important element in the decision-making process. Interest payments on a loan used to purchase a productive asset can be prepaid up to 12 months ahead and deducted from current income. Shirlow (2001) discusses which member of a partnership should hold the asset and which member should take the loan.

Gearing raises the risk-return trade-off of the investment. The average return is magnified, but the volatility of the return is also magnified. Of course, we have already argued that the latter is less significant when the investor has a long time horizon. This approach is a good way to "spice-up" a portfolio. It is superior to the inclusion of so called alternative assets (absolute return or "high alpha" assets) in the portfolio because in the case of gearing it is easy to quantify and manage the risk involved whereas in the case of alternative assets the structures are often very complex, they are one-off propositions and their risk characteristics are difficult to evaluate. Valentine (2004) and Dopfel (2006) point out that the optimal share portfolio to leverage is the market portfolio (i.e. any indexed portfolio).

A geared investment position is exposed to a number of specific risks which an adviser must identify and explain to the client. First, there is a capital value risk. In this context, it is the risk that the capital gain will not be large enough to provide a satisfactory return. There is no magic in gearing itself. The investor must choose an asset which will gain in value. The earlier discussion indicates that, if the asset loses value, the losses are magnified by the gearing. Also, it suggests that the longer the time horizon of the structure, the lower the variability of capital gains/losses.

Secondly, there is an interest rate risk. As an example, consider a leveraged share purchase. If interest rates rise, the investor will face higher interest rates on the loan and the prices of shares are likely to fall. These developments could trigger a margin call. A possible partial mitigant to this risk is if the loan is on a fixed rate rather than a variable rate.

Thirdly, there are some cash flow risks arising from:

- the requirement of the borrower to meet the after-tax interest costs, whereas the capital gains on the asset held do not generate a cash flow. The possibility of an increase in interest rates interacts with this exposure; and
- the possibility that the investor's income will fall so that it becomes more difficult to meet the interest payments and the tax benefit from the interest deduction is eroded or entirely lost.

Fourthly, the investor is exposed to changes in government policies and attitudes. A reduction (increase) in the income tax rate would make the structure less (more) profitable. Similarly, a reduction in the capital gains tax will increase the profitability of the strategy.

Many politicians, public servants and members of the media view negative gearing unfavourably. They see it simply as a tax avoidance scheme which is abused by the wealthier members of society. This view does not appear to have any merit. Interest costs are a legitimate business expense and there is no reason why they should not be deducted from taxable income. If there is a problem, it arises because of the different tax treatment of capital gains and other forms of income (see Fane and Richardson (2005)). Nevertheless, these attitudes could lead to a tightening of the rules on negative gearing or even to its complete disallowance. There was one attempt to do this under the Hawke-Keating government. Negative gearing of rental properties was disallowed. The change resulted in a shortage of rental units and a sharp increase in rents. As a result, the deduction was quickly reinstated.

Fifthly, a rise in interest rates or a fall in the value of the asset could lead to a margin call on the borrower. Therefore, investors need to hold cash reserves to meet these demands. If investors do not have adequate access to cash, they may be forced to sell their assets in the face of margin calls (see next section) or the emergence of cash flow shortfalls. The difficulty with this forced sale is that it is likely to occur at the least favourable time; that is, when asset prices are relatively low. In this context, gearing will be less risky for divisible assets such as shares and managed funds than for indivisible assets such as direct property. Part of a share or managed fund portfolio can be sold off, but not part of a property. Also, as we will see below, there are ways of protecting the value of a

share portfolio, but these techniques are not available for direct property investments.

### The Interaction of High Betas and Leverage

Some writers have argued that relatively few investors would accept the risk of gearing. However, it is probably more common than is recognised. Any investor in a high growth share portfolio is in effect taking a leveraged position based on the gearing of the companies in the portfolio. Growth shares have high betas and according to the Hamada equation (see Brigham and Houston (1999, pp 617-619))

$$\beta_L = \beta_U (1 + [1 - T] D/E)$$

where  $\beta_U$  = beta for an unleveraged firm

$\beta_L$  = beta of the same firm with 1

$D$  = Debt

$E$  = Equity

$T$  = corporate tax rate

$\beta_U$  represents the basic business risk of the company which is inflated by the financial risk created by the gearing of the company. This point does indicate the need to consider the nature of any share portfolio that is financed by borrowing. If it is a high beta portfolio, the effective gearing is much higher than it first appears. This point is further elucidated in the following discussion.

Assume that we invest in a single share.

Then according to the Capital Asset Pricing Model (CAPM):

$$r_t = r_F + \beta(rm_t - r_F) + V_t$$

where  $r_t$  = return on the share in period t

$rm_t$  = market return in period t

$r_F$  = risk-free rate (assumed to be constant)

$\beta$  = beta of this share

$V_t$  = residual for this share

$V_t$  reflects all the individual influences on the share. Now if we consider this relationship in terms of variances (volatility of returns)

$$\sigma_r^2 = \beta^2 \sigma_m^2 + \sigma_v^2 \quad (1)$$

where  $\sigma_r^2$  = variance of the share return

$\sigma_m^2$  = variance of the market return

$\sigma_v^2$  = variance of the individual factors affecting the share return

It is assumed that  $rm_t$  and  $V_t$  are uncorrelated and that  $r_F$  is constant. Now, from above, a leveraged investment in this share has a return given by:

$$R_t = (1 + E) r_t - E r_L$$

Where  $D$  = borrowing in leveraged position

$E$  = equity in leveraged position

$r_L$  = borrowing cost

and we have ignored tax

Therefore

$$\sigma_R^2 = (1 + E)^2 \sigma_r^2 + E^2 \sigma_L^2$$

where  $\sigma_L^2$  is the variance of  $r_L$ . We have assumed  $r_t$  and  $r_L$  are uncorrelated.

Substituting from (1)

$$\sigma_R^2 = (1 + E)^2 \beta^2 \sigma_m^2 + (1 + E)^2 \sigma_v^2 + E^2 \sigma_L^2 \quad (2)$$

The  $\sigma_v^2$  term arises because only one share is held and it illustrates the danger of holding only one risky asset in a leveraged position. If a properly diversified portfolio is adopted  $\sigma_v^2 = 0$  and (2) becomes:

$$\sigma_R^2 = (1 + E)^2 \beta_p^2 \sigma_m^2 + E^2 \sigma_L^2 \quad (3)$$

where  $\beta_p$  is the beta of the portfolio.

Let us assume that  $\sigma_L^2$  is zero. In fact this assumption is unlikely to be correct. Part of the risk of a leveraged position arises from variability in borrowing costs.

Under this assumption (3) becomes:

$$\sigma_R^2 = (1 + E)^2 \beta_p^2 \sigma_m^2$$

or

$$\sigma_R = (1 + E) \beta_p \sigma_m \quad (4)$$

According to the Hamada Equation (ignoring taxes):

$$\beta_p = \beta_u (1 + D_1/E_1)$$

where  $\beta_u$  = unleveraged beta for the diversified portfolio

$D_1, E_1$  = average debt, equity for the portfolio

Then

$$\sigma_R = (1 + E) (1 + \frac{D_1}{E_1}) \beta_u \sigma_m \quad (5)$$

We can conclude from this example:

1. The risk of leveraging is increased if the portfolio is not properly diversified (e.g. one share or property is bought).
2. The risk of leveraging is greater the greater the variability of the borrowing cost.
3. Combining high beta portfolios with leverage increases the risk.

To expand on the third point, note that the effect of the leverage of the investment and the leverage which comes through high betas is multiplicative. For example, if the ratios of debt to equity are unity in both cases, the unleveraged beta of the portfolio is multiplied by 4.

### Margin Loans

The funds for geared investments can be raised from many sources. Financial planners must ensure that clients raise loans at the lowest possible cost. In most versions, the assets purchased act as security for the loan. The investor will then be subject to the maximum LVR (loan to valuation ratio) imposed by their lender. That is, the lender will apply a limit to the leverage that the investor can adopt. Moreover, if a fall in the market value of the asset causes the borrower's LVR to exceed the maximum, the borrower may be asked to provide additional security so as to reduce the ratio.

The nature of a geared investment position suggests that the loan taken should be an interest only loan. A credit foncier loan, which is paid off in equal payments covering both principal and interest, involves a steady reduction in the principal outstanding. That is, it involves an erosion of the gearing, whereas the approach discussed above involves maintaining the gearing (LVR). Also, an investment involving a geared position is a long-term one and it is, therefore, desirable to finance it out of a loan on which the interest rate is fixed for as long as possible.

A particular example of this approach is a margin loan. These loans are generally used to finance share investments. If the LVR rises above the maximum value, a margin call is made which requires the borrower to restore it to that value. Margin lenders decide on the appropriate initial LVR on the basis of:

- the historical variability of the share or shares in the borrower's portfolio; and
- the establishment of a buffer (say, 10% or more) to provide further assurance that the value of the portfolio will not fall below the amount of the loan.

A margin call can be met by:

- contributing cash to pay off some of the loan;
- selling some of the asset in order to pay off the loan; or
- adding more of the asset to the portfolio.

Risk should be judged in the context of the investor's full position. This rate also applies to the use of gearing. The geared position will be embedded in the investor's full portfolio and some of the risks will be offset or magnified by other elements of the portfolio. For example, the investor will need a single cash reserve (or source of access to cash) and the need to meet margin calls is only one of the factors determining the appropriate size of this reserve.

Investors basing their share portfolios on a margin loan face the possibility of margin calls. If these calls cannot be met, part or all of the portfolio will need to be liquidated and at the least favourable time. It has been argued that share investment has a much lower risk if the portfolio is held for a long period. Therefore, the initial position should be set up so that the chance that the investor will not be able to continue the investment for an adequate period is very low. There are a number of ways in which this can be done.

First, the investor's position can be protected by buying an out-of-the-money put option (that is, one with a low strike price). A problem with this approach is that, if share prices fall below the value that will trigger a margin call, the option will need to be sold to meet the call. It will not then be available to meet further falls in share prices. This problem can be overcome by choosing an option with a strike price which means it starts to generate profits as soon as the LVR moves into the buffer. When the margin call is made, the option can be sold and the buffer re-established which allows for further falls before another margin call has to be met.

Secondly, many financial institutions offer protected versions of leveraged share investments. These products offer investors simplicity and a considerable saving in the time needed to manage their investments, but they are relatively expensive.

Thirdly, investors can hold cash reserves which can be used to meet margin calls. The amount of cash held will depend on the price volatility of the shares in the portfolio. Since option premia depend on that volatility, this approach is closely related to the first one.

In the case of leveraged property investments, only the third approach is feasible. There are no derivatives on property prices in Australia and there are no packaged products in the area.

Another popular form of borrowing is the home equity loan. In this case, the LVR is based on the value of the home as well as the assets purchased so that it allows a larger portfolio to be established without concern about margin calls. Note that whether or not interest is tax deductible is determined by the purpose of a loan and not by the security taken for it. One advantage of this approach is that lower interest rates are available because these loans are secured against residential real estate. Another advantage is that it allows the equity in the home to be accessed so that the return on the investor's net worth can be increased. Some excess capacity should be maintained on the borrowing limit in order to meet any cash shortfall.

### Other Ways of Creating Geared Investments

Financial institutions have recognised the attraction of leveraged investments for introducing products that package together various aspects of the approach. The common



denominator of these packages is the simplicity that they deliver to investors.

**Instalment warrants** allow you to buy shares in instalments. For example, you pay 50% of the price now and the remainder at a specified future date. Interest is paid on the outstanding amount, but dividends (on the full value of the shares) are set-off against this interest cost. The holder receives the franking credits from the shares. Instalment warrants can be purchased on the ASX or from a financial institution which issues them. The holder has the alternative of not paying the second instalment and surrendering the shares. This will be chosen if the share price has dropped below 50% of the initial price.

The advantages of instalment warrants are:

- they incorporate a moderate degree of leverage although there are “hot warrants” available which involve a much higher degree of leverage;
- there are no margin calls; and
- existing shareholdings can be exchanged for warrants with a cash payment to the investor and no capital gains tax liability.

Instalment warrants are ideal for DIY superannuation funds because they allow the funds to take a leveraged position in spite of the prohibition on superannuation funds borrowing. However, super funds cannot exchange existing shareholdings for warrants.

**Endowment warrants** are warrants which do not have a specific exercise price or expiry date (see Renton (1999)). They cover individual shares and have terms of around ten years. A purchaser pays from 30 to 75 percent of the value of the underlying shares. In effect, therefore, this instrument is a form of packaged leveraged share investment with an implied outstanding loan. The holder of an endowment warrant makes no further payments over its life, but the outstanding loan is reduced by dividends received and increased according to the (variable) interest rate applicable to the loan. The initial percentage paid is chosen so that the loan falls over time.

The warrant can be exercised (that is, the holder of the warrant receives the underlying share or the cash equivalent) when the outstanding amount is zero or negative. If the warrant is exercised, any negative outstanding amount is paid to the holder. If the outstanding amount remains positive after ten years, the share can be purchased for the outstanding amount plus a small margin. However, if the market price of the share is less than the outstanding amount, the holder of the warrant will not exercise it. Note that the exercise of the warrant does not trigger Capital Gains Tax.

Holders do not pay tax on dividends, do not receive franking credits and cannot claim a tax deduction for their interest payments. They also pay an up-front fee. A warrant is exposed to falls in the dividend rate, increases in interest rates and falls in the share price. This investment is in a single share; that is, there is no diversification.

Some further examples are:

- (a) Managed funds that make leveraged share investments. One advantage of these funds is that DIY superannuation funds can invest in them, although they are prevented from

taking loans.

- (b) Some financial institutions have introduced capital protected equity products which combine a leveraged share investment with an option which ensures that the purchaser will never be required to meet a margin call. No premium is charged for the option, but a higher interest rate is charged on the loan. Recently, the ATO determined that the component of this higher interest rate that could be attributed to the cost of the option would not be allowable as a tax deduction. This treatment is consistent with the normal treatment of option premia which are treated as a capital and not a revenue expense (see Brown and Davis (2005)). However, this determination has since been overturned in court.

## Conclusion

Leverage is a very useful tool of investment which allows investors to magnify the return on their portfolios and to increase the amount of wealth they accumulate for retirement. It will also magnify the short-term variability of returns, but this should not concern an investor with a long time horizon. However, investors and advisers must be aware of the importance of the choice of assets to be geared. The underlying assets must give a satisfactory return. Also, the variability of the return on a geared position is increased if the portfolio is undiversified or if it consists of shares with high betas.

**Notes**

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*Peter J Phillips*

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## EDITORIAL

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This year marks the 6<sup>th</sup> anniversary of the Journal of Law & Financial Management. The journal was founded in the immediate aftermath of the dot com crash and in an atmosphere of high turbulence and uncertainty. A series of large scale corporate collapses and revelations of accounting fraud, regulatory arbitrage and dangerous voids in existing regulatory and governance regimes had resulted in a heightened focus on the need for reform. Today's climate may be characterised by the emergence of similar themes, with developments in the U.S subprime lending market giving the appearance of a potential source of profound trouble going forward.

While many previous editions of the journal have been given over to contemplation of "big picture" regulatory and legal issues, and their financial implications, this edition consists of a series of papers focused on an investor perspective, with a strong recognition of the role that taxation and taxation effects can have on outcomes.

Peter Phillips has contributed a highly insightful article on self managed superannuation funds, a topic guaranteed to generate more discussion as time goes on. Tom Valentine revisits vital questions pertaining to gearing and negative gearing in an investment context, whilst Gordon Mackenzie and Geoffrey Hart investigate the under researched area of finance lease taxation.

Tyrone M Carlin & Guy Ford

Sydney, July 2007